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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/941,371	08/28/2001	Mark Kintis	12-1201	6016
30050	7590	11/17/2004	EXAMINER	
PATENT COUNSEL, TRW INC. S & E LAW DEPT. ONE SPACE PARK, BLDG. E2/6051 REDONDO BEACH, CA 90278			FILE, ERIN M	
			ART UNIT	PAPER NUMBER
			2634	

DATE MAILED: 11/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	09/941,371		KINTIS, MARK	
	<b>Examiner</b>		<b>Art Unit</b>	
	Erin M. File		2634	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

**A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.**

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 August 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                                    |

***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 7 and 28 are rejected under U.S.C. 102(a) as being unpatentable over Thorson.

**Claim 1**, Thorson discloses a circuit comprising:

- a first mixer stage (fig 1) including a mixer (122) with first (133) and second (221) input ports and a first output port (117)
- a second mixer stage which including a second mixer (120) with third (131) and forth (219) input ports and a second output port (115) with first input port (133) electrically coupled to third input port (131)
- A phase modulator (242) for phase modulating a first local oscillator signal (113) electrically coupled to first input port (133)
- An inverse phase modulator (240) for inverse phase modulating a second local oscillator signal (111) electrically coupled to third input port

**Claim 7**, contains all of the limitations of Claim 1.

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**Claim 28**, contains all of the limitations of Claim 1.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 2, 3, 12, 13, 14, 29, 30 and 32 are rejected under U.S.C. 103(a) as being unpatentable over Thorson in view of Underbrink et al.

**Claim 2**, inherits the limitations of Claim 1. Thorson does not specifically disclose a phase shift keying (PSK) modulator. However, a PSK modulation is a very general type of phase modulation in which digital information is modulated by changes in phase angle. In his apparatus for producing a modulated signal Underbrink discloses the use of PSK modulation in his digital modulation technique (abstract). Because of the prevalence of digital data in communications systems it would be obvious to one skilled in the art to use PSK modulator for a Phase Modulator at the time of invention.

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**Claim 3**, inherits the limitations of Claim 1. Thorson does not specifically disclose an inverse phase shift keying (PSK) modulator. Because of the prevalence of PSK modulation in digital communications, for reasons listed in the paragraph above, it would be obvious to one skilled in the art at the time of invention to use an inverse PSK modulator for an inverse Phase Modulator.

**Claim 12**, inherits all of the limitation in claim 1, Thorson does not specifically disclose a quaternary phase shift keying (QPSK) modulator. A QPSK modulator is a common type of PSK modulator. In his digital modulation technique Underbrink discloses the use of QPSK modulation as a type of PSK modulation in which four carrier phases are used (col 7, lines 65-68). QPSK modulation is commonly used in the art because of its high transmission efficiency rate and would be obvious to one skilled in the art to use QPSK modulator for a Phase Modulator at the time of invention.

**Claim 13**, contains all of the limitations of Claim 3.

**Claim 14**, inherits all of the limitation in claim 1, Thorson does not specifically disclose an M-ary modulator and inverse M-ary modulator. In his digital modulation technique Underbrink discloses the use of M-ary, or MPSK modulation as a type of PSK modulation in which multiple carrier phases are used (col 8, lines 1-4). M-ary, or multiple phase modulation, is advantageous because it produces improved error performance. It would be obvious to one

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skilled in the art to use an M-ary modulator and inverse M-ary modulator for a Phase Modulator and inverse Phase Modulator at the time of invention.

**Claim 29**, inherits all of the limitation in claim 28. Thorson does not specifically disclose a binary phase shift keying (BPSK) modulator and inverse modulator. However, BPSK is a common type of phase modulation. In his digital modulation technique Underbrink discloses the use of BPSK modulation as a type of PSK modulation in which two carrier phases are used (col 7, lines 45-63). BPSK modulation is commonly used because of its simplicity and high tolerance to noise. It would be obvious to one skilled in the art to use BPSK modulation and inverse modulation for a Phase Modulation and inverse Modulation at the time of invention.

**Claim 30**, includes all of the limitations of Claim 12.

**Claim 32**, includes the limitations of Claim 14.

5. Claims 15 and 31 are rejected under U.S.C. 103(a) as being unpatentable over Thorson in view of Scott.

**Claim 15**, inherits all of the limitation in claim 1, Thorson does not specifically disclose a GMSK modulator and inverse modulator. However in his modulation device Scott teaches a phase modulator with an alternate embodiment that

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includes the use of GMSK modulation instead of PSK modulation (col 18, line 60). Because GMSK is a type of phase modulation and has the benefit of reducing the bandwidth required to modulate signals it would be obvious to one skilled in the art to use the GMSK modulator and inverse modulator in Thorson's apparatus at the time of invention.

**Claim 31**, includes all of the limitations of Claim 15.

6. Claims 4 and 5 are rejected under U.S.C. 103(a) as being unpatentable over Thorson in view of Horiguchi et al. and Underbrink et al.

**Claim 4**, inherits the limitations of claim 2. Thorson does not specifically disclose a binary phase shift keying (BPSK) modulator modulated according to a pseudorandom number (PN) code. A BPSK modulator is a common type of phase modulation device. The reasons for using BPSK as a phase modulation technique are discussed in preceding paragraphs. Horiguchi teaches a pseudorandom number (PN) code generator (fig 14, 51) controlling a phase modulators (47) that outputs a mixer. The use of a PN code to synchronize BPSK modulators is well known in the art and would be obvious at the time of invention to incorporate PN code controller such as Horiguchi's into Thorson's mixing device.

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**Claim 5**, contains the limitations of claim 4. Neither Thorson nor Horiguchi disclose an inverse BPSK modulator. The reasons for using BPSK as a phase modulation technique are discussed in preceding paragraphs. It would be obvious to one skilled in the art at the time of invention to use an inverse BPSK modulator for an inverse Phase Modulator.

7. Claims 6, 8, and 9 are rejected under U.S.C. 103(a) as being unpatentable over Thorson in view of Koslov et al.

**Claim 6**, inherits the limitations of Claim 1, Thorson does not disclose a configuration in which an intermediate filter coupled between the first mixer's output port and one of the second mixer's input ports. However, Koslov teaches a first mixer (fig 16, 602) controlled by a local oscillator (608) connected to an filter (604) coupled to a second mixer (606) controlled by a local oscillator (610). The use of a filter between the mixing units is advantageous because they reduce leakage that can occur from local oscillator inputs. Because of this it would be obvious to one skilled in the art at the time of invention to incorporate this means into Thorson's apparatus.

**Claim 8**, all of the limitations of Claim 8 are contained in the limitations of Claim 6.

**Claim 9**, contains all of the limitations of Claim 6.



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8. Claims 10 and 11 are rejected under U.S.C. 103(a) as being unpatentable over Thorson in view of Jaques et al. and Horiguchi et al. and Underbrink et al.

**Claim 10**, inherits the limitations of claim 9. Although Thorson does not disclose a binary phase shift keying (BPSK) modulator modulated according to a pseudorandom number (PN) code. In his digital modulation technique Underbrink discloses the use of BPSK modulation as a type of PSK modulation in which two carrier phases are used (col 7, lines 45-63). BPSK modulation is commonly used because of its simplicity and high tolerance to noise. Horiguchi teaches a pseudorandom number (PN) code generator (fig 14, 51) controlling a phase modulators (47) that outputs two a two input mixer. The use of a PN code to synchronize BPSK modulators is well known in the art and would be obvious at the time of invention to incorporate PN code controller such as Horiguchi's into Thorson's mixing device.

**Claim 11**, inherits the limitations of claim 10. Thorson does not disclose an inverse binary phase shift keying (BPSK) modulator modulated according to a pseudorandom number (PN) code. The use of a PN code generator to control a BPSK modulator is discussed in Claim 10. An inverse BPSK modulator is commonly used, for reasons listed in preceding paragraphs, and would be obvious to one skilled in the art to use an inverse BPSK modulator, controlled by a PN code generator, for an inverse Phase Modulator at the time of invention.

***Claim Rejections - 35 USC § 112***

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

**Claim 16**, recites the limitation

"...a first mixer having first and second input ports and a second output port..."

This claim is rendered indefinite because it specifies a second output port without specifying a first output port.

There is insufficient antecedent basis for this limitation in the claim.

**Claims 17, 18, 19, 20, 21, 22, 23, 24, 25, 26 and 27** are rejected as being dependent on a claim rendered vague and indefinite.

***Claim Objections***

11. Claim 1 is objected to because of the following informalities:

The word forth is used instead of fourth.

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Appropriate correction is required.

12. Claims 4, 10, and 21 are objected to because of the following informalities:

"psuedorandom" is correctly spelled *pseudorandom*

Appropriate correction is required.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin M. File whose telephone number is (571)272-6040. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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